## Geometric Solids

## Summary

This activity will give the students opportunity to identify both abstract drawings of geometric solids and realistic shapes in the environment.

Main Core Tie
Mathematics Grade 1
Strand: GEOMETRY (1.G.) Standard 1.G. 2

## Additional Core Ties

Mathematics Grade 1
Strand: GEOMETRY (1.G.) Standard 1.G. 1
Materials

- Round Is a Mooncake: A Book of Shapes
- Shape Locator (one card/two students) (pdf)

Disposable or digital camera
Writing paper
Pencils
Geometric Figures Tub
Eight double-sided utility boxes

- Geometric Solids Vocabulary Cards (pdf)
- Shape Matching Exercise (pdf)


## Additional Resources

Books

- Round Is a Mooncake: A Book of Shapes
, by Roseanne Thong; ISBN 978-0439318327
- Looking at Shapes
, by Dr. Shirley Tucker and Jane Rambo; ISBN 978-0736812849
- Cubes, Cones, Cylinders, \& Spheres
, by Tana Hoban; ISBN 978-0688153250
- Shapes, Shapes, Shapes
, by Tana Hoban; ISBN 978-0688147402
- So Many Circles, So Many Squares
, by Taba Hoban; ISBN 978-0688151652
- Captain Invincible and the Space Shapes
, by Stuart Murphy; ISBN 978-0064467315


## Background for Teachers

This activity will give the students opportunity to think mathematically and bridge from abstract drawings of geometric solids to realistic shapes in the environment. Students can display their knowledge of shape recognition using photographs. The students will deepen their understanding of geometric solids by writing a sentence about the geometric shape located in their photograph. Students will be given an opportunity to sort geometric solids and apply their understanding of skip counting by counting the solids after the sort is completed.

## Intended Learning Outcomes

5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

## Instructional Procedures

## Invitation to Learn

Read the book Round Is a Mooncake: A Book of Shapes. This book becomes a discovery experience for things round, square and rectangular. Most of the objects are Asian in origin. A short glossary provides a cultural connection to the objects shown in the book.

## Instructional Procedures

Shape Field Trip
Take a Shape Field Trip around the school or around the neighborhood.
Give each pair of students a Shape Locator Card to assist in their location of shapes.
Students will raise the card when they have located a picture they want to photograph.
Students must be able to name the object and the geometric figure it represents.
Take a picture of the object using a disposable or digital camera.
Print out the pictures on individual papers for each student to write a sentence describing the object and the geometric figure it represents. (e.g., "The flag in Mrs. Smith's class is in the shape of a rectangle." or "The stop sign at the corner is in the shape of a hexagon.") Compile the pictures to make a classroom book or type the students' sentences in a Word Processing Program to make a slide show presentation that can be linked to your school's web site.
Geometric Sort
In a math center invite students to sort the tub of geometric figures by placing 10 matching shapes in each tackle box.
Ask the students to tell you how many shapes there are in all.
Guide their understanding of skip counting to count by tens for each box that is filled.
Next, the students will sort the shapes by placing five matching shapes in each tackle box.
Guide them to skip count by fives to obtain the answer.
Ask them to compare which method of counting was longer, shorter, faster, slower, etc.
Encourage them to find other ways to count the shapes (e.g., counting by ones or twos).

## Extensions

Students can create their own matching exercises using the pictures they took on the Shape
Field Trip and matching them to the sentences they wrote.
After sorting the geometric figures, students can match the correct vocabulary word card with the corresponding box of shapes.
Family Connections
Send home a copy of the Shape Locator and ask students to locate objects at home that can be brought to school (e.g., a cereal box represents a rectangular prism and a can of soup represents a cylinder).
Students can match the vocabulary/word cards and pictures at home for further practice.

## Assessment Plan

The shapes the students locate and photograph on the Shape Field Trip and the sentences the students write for their classroom book can be used to assess student understanding of basic geometric figures.
Distribute the Shape Matching Exercise that requires students to match meanings to words (e.g., match the pyramid to the sentence that describes it).

Bibliography
Research Basis
National Research Council. (2002). Helping Children Learn Mathematics. Mathematics Learning Study committee, J. Kilpatrick and J. Swafford, Editors. Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press, p. 26.
This study outlines the five strands of mathematical proficiency. "Proficiency is much more likely to develop when a mathematics classroom is a community of learners rather than isolated individuals." Questioning and discussion that encourages students' thinking and problem solving strategies lead to greater understanding of mathematical concepts and ideas.
Blachowicz, C. \& Fisher, P. J., (2006). Teaching Vocabulary in All Classrooms, p. 102.
This book suggests that one of the easiest ways to review new words for familiar concepts is with exercises that require students to match meanings to words.

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